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# Fundamentals in Nature

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# Fundamentals in Nature

Merging graphic design education and the natural world

Andrea L. Quam



*Submitted to the faculty of the School of the Arts at Virginia Commonwealth University in partial fulfillment of the requirements for the degree, Master of Fine Arts in Design, Visual Communications.*

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**Abstract** This project explores innovative methodologies for design education.  
It is an investigation of teaching design fundamentals in an outdoor classroom.





**Introduction** I have always had an appreciation and awe for the natural world. Growing up in rural Iowa, the woods surrounding my home were my playground. I spent every possible hour wrapped in nature’s beauty and exploring its secrets. However, as a child, I took this for granted, never consciously considering the relationship I had with the outdoors.

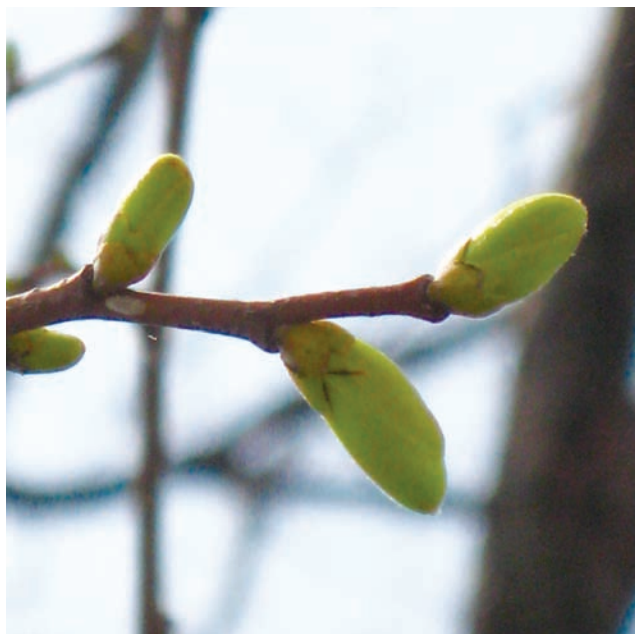
The woods were not only entertaining, they were also educational. I played in streams, climbed trees and created my own magical kingdom in the woods. Nature taught me about the cycles of life, death, decomposition and re-growth. I experienced these principals first-hand before learning about them in the classroom.

When it came time to attend college I chose my love of art over the outdoors, and majored in graphic design. College breaks were often spent on canoe trips and adventures in National Parks, but I never realized the close relationship I once had with the natural world was fading. As I moved to an urban environment to practice and follow my design career, I became further removed. However, moving to Virginia and attending graduate school has helped me realize how much I have lost touch with the natural world.

My creative project is a search for a personal reconnection with the natural world and to merge this endeavor with my interest in graphic design education. My creative project began with investigations into sustainability in graphic design. I quickly learned that sustainability is more than just the correct use of materials—it is about balance: balance between present environmental, social, and economic needs, in addition to concern for future generations.

My project integrates my interests and concerns into an innovative approach of using the natural world as an outdoor classroom. I have developed a card-based system that may be used as a tool for design instructors to teach the fundamentals of design within the context of the outdoors.









**Problem Statement** Design educators have a long, well-established tradition of teaching the fundamental principles of form.





The elements and principles of design are the basis of ubiquitous visual language. While many theorists approach the specifics of this language differently, they all acknowledge its importance as a foundation for the education of visual communicators.

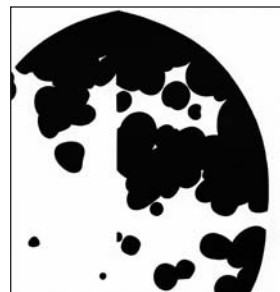
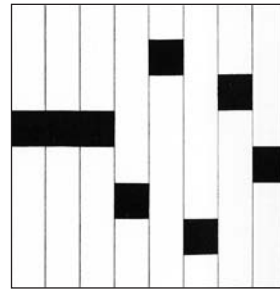
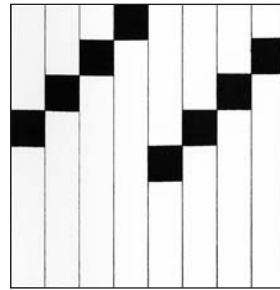
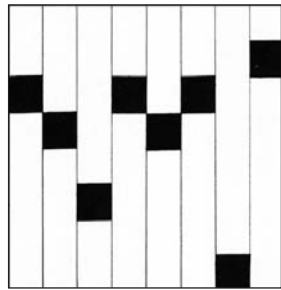
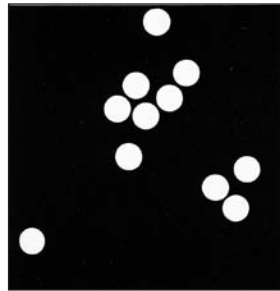
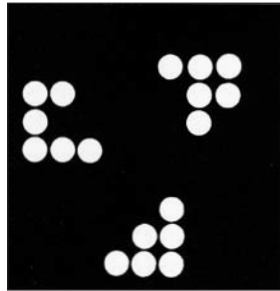
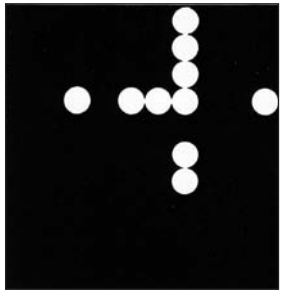
*Water droplets are an example of equilibrium, a Gestalt Principle of Perception, which states that every psychological field tends toward balance and efficiency resulting in shapes that are 'closed.'*

Early 19th century Gestalt theorists such as Max Wertheimer, Wolfgang Kohler and Kurt Koffka have been lauded for their studies that inform the perceptual aspects of visual language. Their studies of perception united the physical aspect of sight with how vision is processed psychologically. Through their research, they developed seven Gestalt Principles of Perception: figure ground, equilibrium, isomorphic correspondence, closure, proximity, continuation, and similarity. These principles form much of our understanding of visual thinking and perception and are the underpinnings of design education.

The Bauhaus (*Das Staatliches Bauhaus*) and Basel School (*Allegemeine Gewerbeschule*) are two schools recognized as cornerstones of design education. Walter Gropius established the Bauhaus in 1919 at Weimar, Germany. Several Bauhaus instructors published books on design education that emphasized the premise of design elements and principles. Wassily Kandinsky published *Point and Line to Plane* in 1926. Kandinsky saw his book as a systemization of his theoretical ideas in which he sought to establish certain analytical methods while taking relational or compositional values into account. His goal was to illuminate how the basic elements are viewed. Johannes Itten wrote *The Art of Color*, *The Elements of Color* and *Design and Form*. In his writings he recognized the basic laws of color and form, proportions and texture, and rhythm as the foundation of his concept of art education.

The Basel School's (*Allegemeine Gewerbeschule*) graphic design program developed from the rich heritage of the Swiss graphic design scene of the 1950s and 1960s. Two revered instructors from this school also produced books that underscored the importance of foundational elements and principles of design. Armin Hofmann published *Graphic Design Manual Principles and Practice* in 1965. Hofmann believed line, plane, surface, color, material, space, and time should be presented to students as a coherent whole. His addition of this new dimensional view called for an extension of the principles of design.

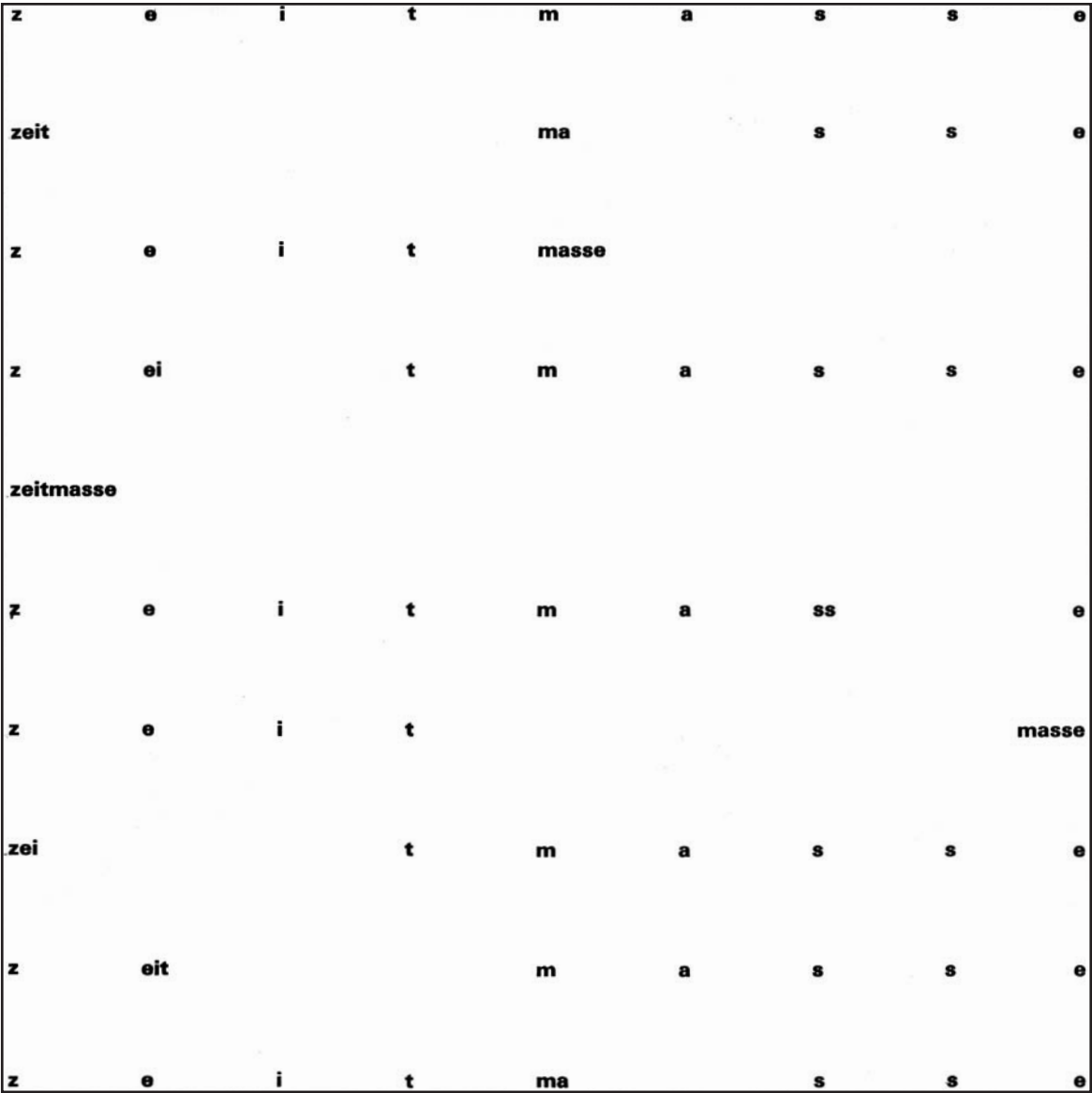




Three dot studies from Armin Hofmann's  
Graphic Design Manual, 1965.

In 1967, another instructor from the Basel School of Design, Emil Ruder, released *Typography—A Manual of Design*. In his book Ruder illustrates the elements and principles of design through examples of his work, student work and historic reference. He illustrates through typography design elements and principles such as: point, line and surface, form and counter-form, proportions, contrast, color, unity, rhythm, spontaneity and fortuity, variations and kinetics.

Instructors from these established schools have not been the only ones to promote the elements and principles of design as the essential basis for design education. In 1972, Wucious Wong authored *Principles of Two-Dimensional Design*. He hoped to develop a visual logic by which students could be led to understand the elements of design, the possibilities of organizing them and the limitations. In 1973, the MIT press published *A Primer of Visual Literacy* by Donis A. Dondis. The goal of Dondis' book was to examine the basic visual elements and the psychological and physiological implications of creative composition. Dondis parallels visual literacy with verbal literacy, stating that visual literacy must operate within the same boundaries. One of the more recent editions to this list of foundational design books is Christian Leborg's 2006 release of *Visual Grammar*. Leborg pulls from the theorists and authors before him such as Wucious Wong and Donis A. Dondis and develops his own unique perspectives of syntax. Each of these books build upon the premise of a visual language based on the elements and principles of design. This tradition of design education has stood the test of time and laid the foundation for contemporary design education. The way in which this visual language is taught, however, should be considered for a changing demographic of design students.



Demonstration of rhythm, Emil Ruder  
Typography, 1977.

While contemporary graphic design students benefit equally from a solid understanding of the elements and principles of design, they are very different from the students of the 1920s—or even the 1970s.

One of the largest and most impactful advents in the field of graphic design has been the introduction of the computer. The computer has not only changed the way design is produced and practiced, it has had a large role in shaping the individuals that now fill the seats of classrooms. The design students of today are from the ‘Net’ generation (those born between 1977–1999) who have only known a life embedded with technology. The ‘Net’ generation has had access to super-realistic video games, the Internet, e-mail, instant messaging, online communities, videos, and music that can be downloaded at will. This level of interactive technology is shaping the ‘Net’ generation’s culture, values, and world outlook. In teaching it is important to consider the information that needs to be delivered, but also the nature of the audience receiving it. What then might be a unique and valuable way of delivering information to such a ‘plugged-in’ generation?

This is where I believe the natural world as an outdoor classroom may provide not only a unique arena of presentation for current design students, but one that can provide value as well. The Bauhaus and Basel schools used nature in their foundation courses, but only as the subject matter for form studies. The natural world’s beauty is also full of meaning. At a time when many are seeking emotional reach from their computers, exposure to the natural world is essential.

In *Last Child in the Woods* Richard Louv states today’s ‘Net’ generation is aware of global threats to the environment, but their physical contact and their intimacy with nature is fading. His book investigates the increasing divide between youth and the natural world and the environmental, social, psychological, and spiritual implications of that change.





In *The Green Imperative* Victor Papanek theorizes that deeply embedded in our collective unconscious is our intuitive awareness of our relationship to the natural world. This awareness has gone through drastic pendulum swings throughout human history. However, mankind seems more distant now than ever. As Papanek points out, during the last century two major changes have occurred that contribute to the human disconnect from the natural world. First, we have nearly all—at least in the northern half of the globe—moved indoors. There are still jobs that take us outdoors, but even farmers plowing their fields sit in air-conditioned cabs, and most of us spend our time in homes, cars, workplaces, or public buildings. The second change is that we have now attained the power to change the natural order of the earth and throw it out of harmony.

Bringing the design classroom outdoors provides opportunity at many levels. Students may have the chance to experience the natural world, as they never have before. They will be removed from not only the classroom, but also the computer. They will be asked to use traditional hand skills such as drawing and sketching. Finding the elements and principles of design in the natural world reinforces their understanding of them and creates a conceptual connection. Students will be able to experience first hand a relationship between design and the natural world—this unexpected relationship can open students to expansive thought processes. As they learn about, observe and better understand nature, an inherent concern and respect develops. It is hopeful that this will create a design approach based on value and a deeper respect for the environment and audience.





**Methods** My initial investigations for this project involved defining and understanding sustainability's relationship with graphic design.





Ultimately, I determined the changes that needed to take place would not occur until individuals felt vested and connected. My focus became narrowed to reconnecting people with the natural world.

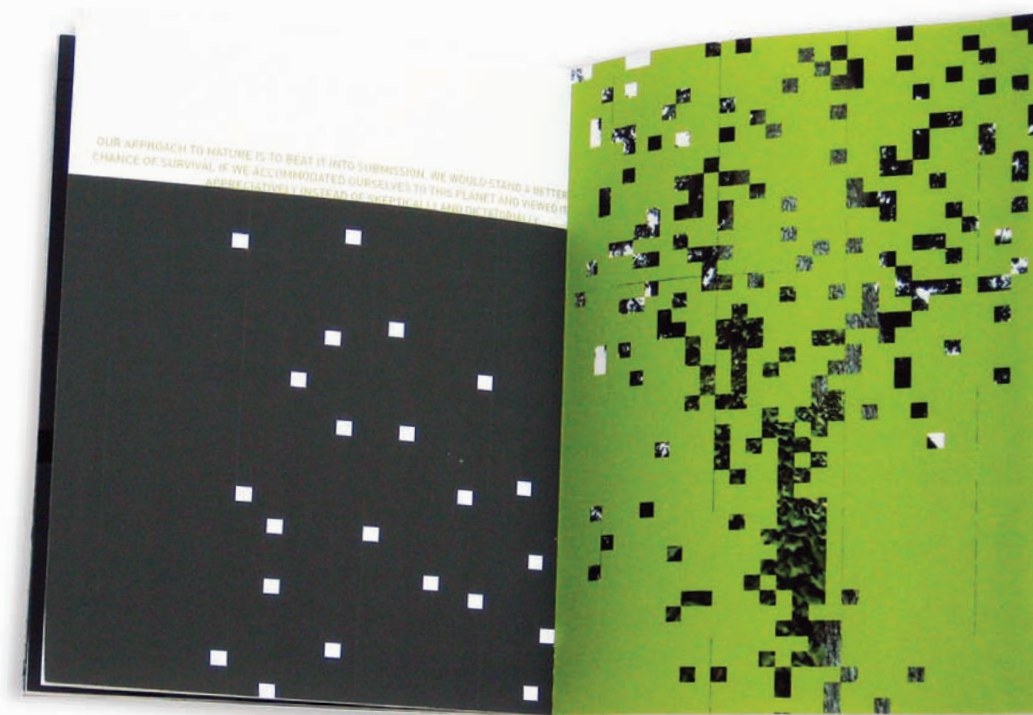
*The Macro-Micro book challenged perspectives of nature with unexpected scale shifts.*

During the 2007 Fall semester I explored this idea by creating several small books examining current relationships to the natural world. These explorations helped me realize that connection would not be established by acknowledgement and contemplation alone. At that point I felt my audience needed to be encouraged and guided to experience nature on an individual level—to explore the natural world.

The concept of guiding people to nature generated the idea of creating a guidebook to the natural world. This guidebook would have a series of documented methods that involved immersion in nature, which people could duplicate, modify, or enhance.

I began my exploration by creating a taxonomy of nature and travel guide materials. I found that they shared key characteristics. One of the most important is allowing individuals to enter experiences or environments new to them with a degree of knowledge and certainty. Such a foundation establishes a base for exploration and discovery. Instructions on how to use the book or guide are often located in its introduction. Most guides contain history, maps, facts, and trivia. Their format is often small for ease of portability, and text and image are often equally weighted.

Writing the methods for my guidebook proved challenging. My first approaches were derived from the Situationists' *dérive* practice. In this practice, the Situationists aimlessly wander with no destination, soaking up the city's ambience. While I felt the methods I composed in this genre encouraged experimentation and experience, they lacked connection and meaning. My next attempts looked at methods that utilized childhood memories of a natural play area, contrasted with a current visit to the same place. Continuing to move forward by examining experience, I looked at methods that focused on our senses. While these methods began to focus on the natural world, they were still vague and lacking in an effective connection.



*Spreads from exploratory books, Fall semester 2007*





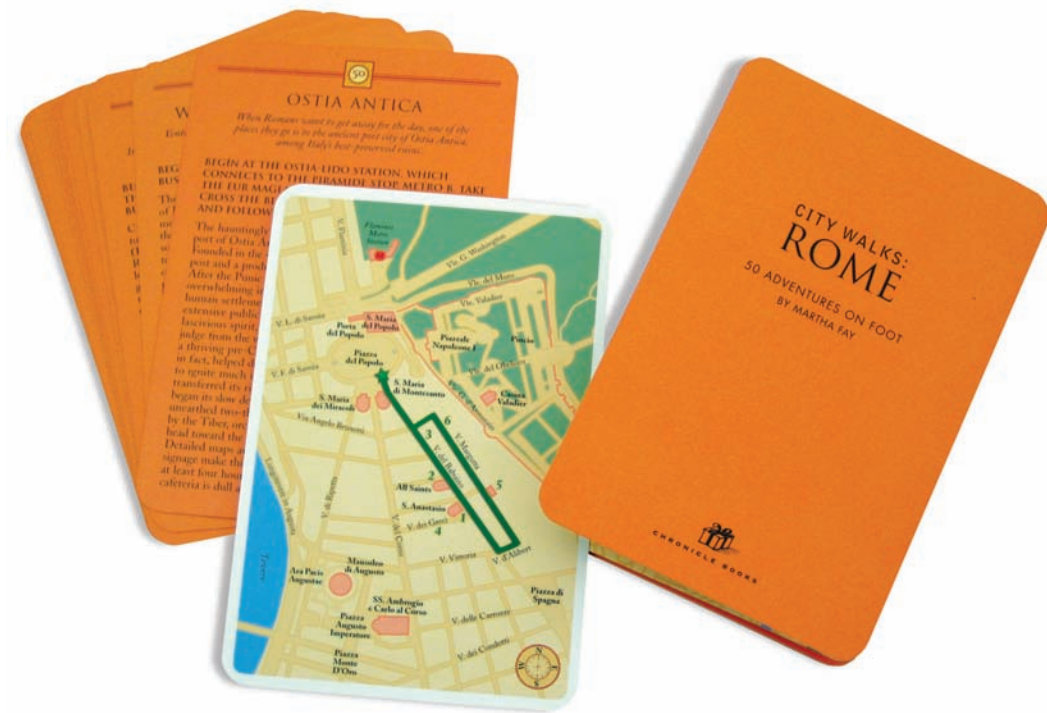
Structure for my project came from my struggle to write the nature guide's methods. I realized to write an effective method or objective I needed a more focused audience and more specific objectives. A reflection on the evolution of my personal relationship with nature and my passion for design education held potential for focus. I realized there was a correlation I could make between the two. My audience would be graphic design students with the objective of teaching design fundamentals through the use of the natural world as an outdoor classroom.

With a narrowed audience and objective I re-evaluated the idea of a guidebook—was this the most effective way to connect design students with the natural world? This question led me to realize the value and importance of getting students outside. The next question was, once outdoors how and what would I teach them about graphic design?

It was at this point that the importance and relevance of Gestalt theory in relation to my project became apparent. Gestalt's theoretical base is the belief that an approach to understanding and analyzing all systems requires recognition that the system (or object or event) as a whole is made up of interacting parts, which can be isolated and viewed as completely independent and then reassembled into the whole. No part of the system can be changed without modifying the whole.

Gestalt psychologists have contributed valuable experimentation and research in the area of perception, collecting data and analyzing the significance of visual patterns. It is also interested in how humans see and organize visual input and articulate visual output. The way in which elements come together creates the meaning and purpose of the visual statement and carries strong implications for what the viewer receives. Gestalt thought takes into consideration not only the visual foundations upon which design is built, but it also echoes one of the most valuable messages the natural world has to teach us: *everything is connected*.





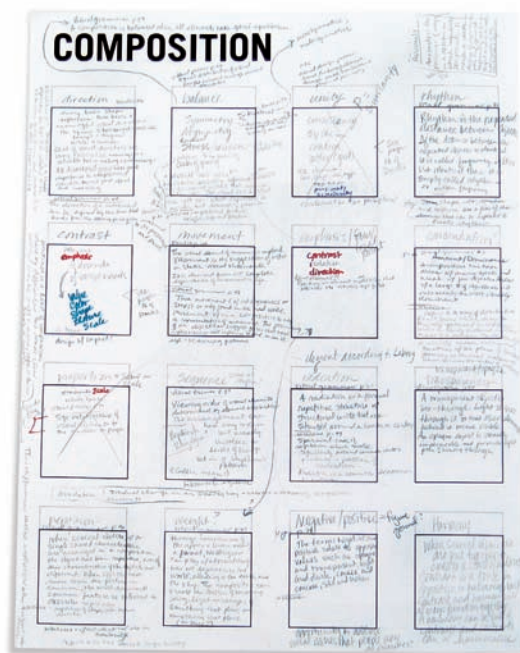
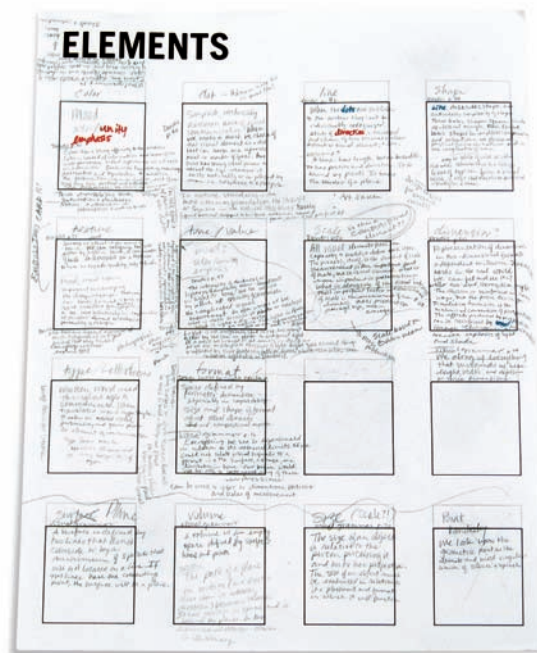
City Walks: Rome, a nontraditional travel guide discovered

Gestalt was the entry point for my realization that the content of my project should focus on design fundamentals—the elements and principles of design, as well as the gestalt principles of perception.

The idea of connection through perception and perception of visual grammar led me to research graphic design canons. *A Primer of Visual Literacy*, *Point and Line to Plane*, *Principles of Two-Dimensional Form* and *Visual Grammar* significantly influenced my project. These references informed the topics my project would address through the outdoor classroom. I discovered that each theorist had a different idea of what constituted principles, or even elements of design. I developed my own categories as a synthesis of these sources.

As I considered my outdoor setting, and pondered the form my project should take, I remembered a precedent, *City Walks: Rome*, discovered while studying the guidebooks. This resource was not a book, but a box of cards that created a nontraditional travel guide. Each card contained a description of a one-day, self-guided walking adventure with insider information about a Roman neighborhood and a map on the reverse side. Another set of instructional cards I encountered earlier in my research was the IDEO Method cards. IDEO is an innovation and design firm that uses a human-centered, design-based approach to help organizations generate products, services, and capabilities. IDEO cards offer discrete methods that can be used to keep people at the center of the design process. I found each of these examples to be an interesting way of presenting information that is flexible, portable and engaging for the viewer—ideal for an outdoor classroom.





Researching the varied definitions of the elements and compositional aspects (or principles) of design.

At this juncture the form and content of my creative project was established. My form would be a deck of educational cards that could be used as an instructional aid to teach sophomore level graphic design students. The content would address design fundamentals (elements, aspects of composition, and Gestalt Principles of Perception). My next step was to develop the specific content for the cards that relate to nature, and the system or methods structuring the use of the cards.

Initially, I intended for students to go to a natural area with a card or a series of cards, find an example of the visual grammar listed on the card and create a visual record of it. This was rejected because of its didactic nature that introduced theory to students before they had an opportunity to discover and experience conditions on their own. Josef Albers' *Interaction of Color* was discovered as a precedent of instruction that allows for experimentation and discovery before the introduction of theory. With this in mind I developed tasks that sent students to specific, natural areas providing opportunity for individual discovery within a structured task. This left the understanding of foundational design grammar to occur after their task, through a process of co-construction when the class came back together after completing their individual tasks.



**Project Realization** An important aspect of the development of the cards  
was determining the methods and structure for their use.





I had to first impart an understanding of what the cards were and how they were to be used. This was accomplished through a booklet accompanying the cards.

The booklet contains six topics: descriptions of card categories, suggested use of the cards, suggestions for inclement weather, a complete supply list, bibliography, and discussion topics for possible outcomes.

The cards are composed of four categories: task cards, element cards, composition cards, and Gestalt Perception cards. It is intended that the student begin with a task card. Each task card has three phases that lead the student from an intuitive approach, to a theoretical approach, to an application of graphic design. For example, if a student starts with the first ‘soundscape’ task card they will be instructed to go out and visualize sound. They will then return with their classmates, share their work and view their classmates’ compositions as well. It is at this point that the students would receive the rest of the cards (elements, composition and Gestalt Perception cards). Through co-construction the class would evaluate and begin to understand the theories and formal aspects at work in their compositions. With the second task card in the series they would then apply what they had learned by adding to or recreating their composition. In the final task, of this example, the students would be asked to create a poster that promotes the area their soundscape was created in, applying typography and the elements and principles they had learned.



Instructors would be the primary dispenser of this deck of cards, with the students gaining access to particular cards in specific phases of the project. The cards and an accompanying booklet would be a teaching tool that provides project structure, references, discussion points and visual aids for the instructor in the outdoors. During certain points of the projects students may receive specific cards or photocopies of specific cards for task directions or definitions of elements, compositional aspects or Gestalt Principles of Perception.

On the front side of the elements, composition, and perception cards the formal aspects of visual communication are introduced along with a visual example. The reverse side of the card contextualizes the example in the natural world, providing natural facts and learning points. Each task card details a task on the front and provides a visual of design precedent on the back, along with interesting facts and details of the precedent's designer.

The goal of the cards is for students to have a greater interest and respect for the natural world as they learn about design fundamentals. This approach adds value and conceptual connection to the teaching of graphic design.





**Exhibition** Creating an exhibition from this project was a challenge  
because of its small format.

The small scale of the system components—even when spread out—does not create a substantial gallery presence. I determined it would be essential to present the cards at a large scale.



I created a poster series that leads the viewer through the process of using the cards. Also displayed were sample results from each of the three task levels that structure the process. It was important to feature the cards prominently in the exhibit. Instead of displaying them as deck on a pedestal where they may be overlooked, I hung the cards from the ceiling in front of the descriptive posters. By evenly spacing them on fishing line, the categories were able to hang from the ceiling creating depth and interest. This also emphasized their important role in the project. The accompanying booklet and sample cards were displayed on pedestals at the beginning of the poster series. This allowed the viewer to hold and turn them as one would if using them.

The display at the exhibition was well received. Many responded to the clear explanatory posters. I received comments that the system appeared complete and was easily understood from viewing the posters and soundscape task example.





**Evaluation** Distance and time away from a project have a crystallizing effect allowing me to critically evaluate projects and the knowledge gained from them.



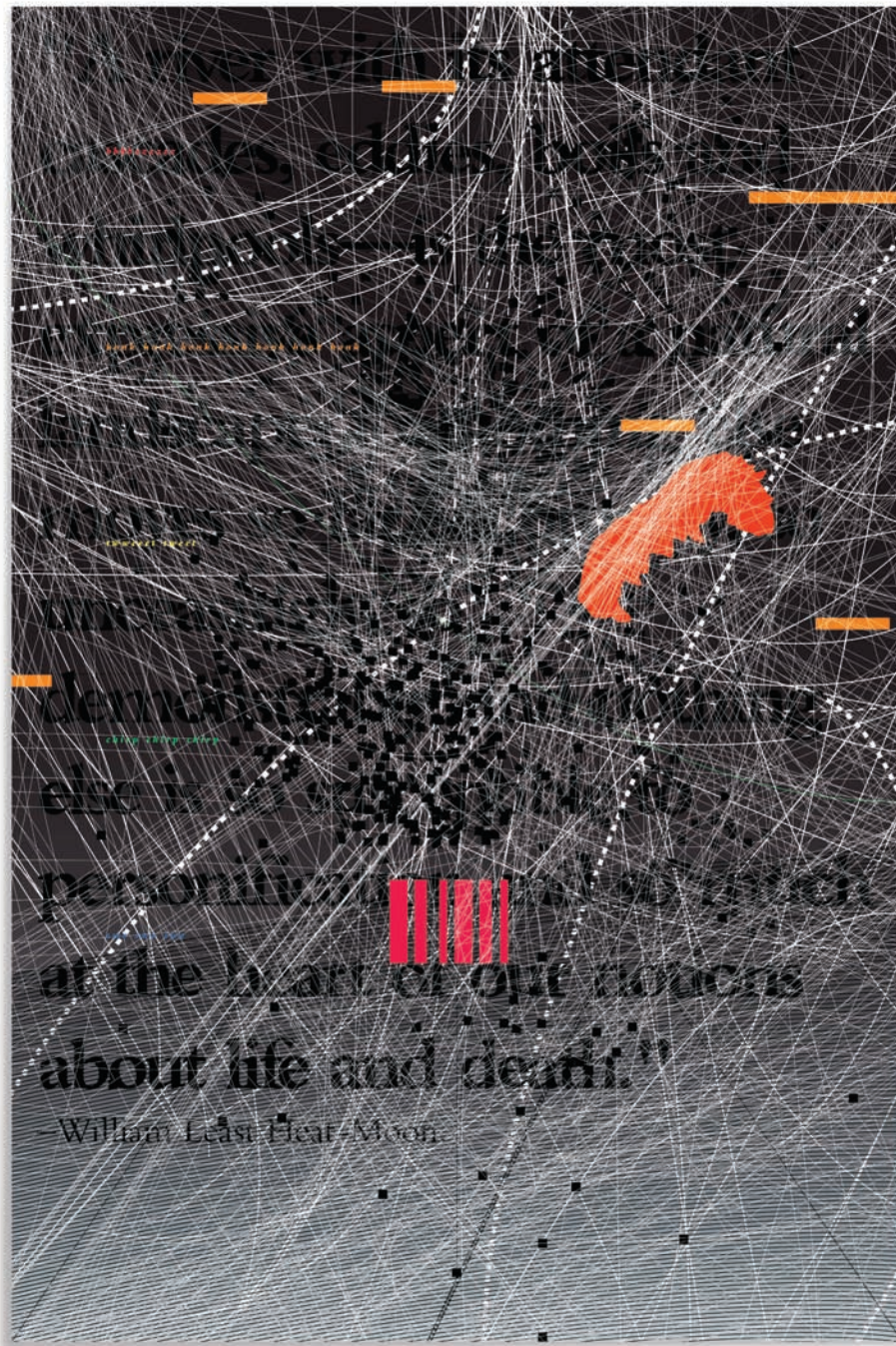
I have realized the importance of this project lies not in the artifact, as is often the case in the professional practice of graphic design, but rather the process and path that led to its creation.

I believe the most important aspects of this project were those that encouraged my own re-evaluation of the expansive nature of graphic design and design education.

Many current concerns in society and graphic design revolve around the idea of sustainability—regard for a balance of the needs of the environment, society, economy, and future generations. We no longer embrace technology as the answer, but instead have begun to question its effects. Society understands the detrimental effects of technology on the environment and children, who have grown up enmeshed in it. These are the students currently filling design classrooms. This project demonstrates innovation in design education, and how these societal concerns may be included in the development of design education. I believe it is an opportunity to make considerations of sustainability a part of the educational process and discussion, not a specialization. This adds value and experience to design education by focusing the students on their relationship to the natural world. I hope my creative project is a contribution to the field of design in this way.

I often focused on the creation of an artifact to bring meaning and satisfaction to my design work before returning to graduate school. This project has not only calibrated my focus, but also effectively illustrates how design can be taught in a meaningful manner focusing on experience, process, and conceptual connection. This project has deepened my understanding of the role of a design educator. It has also furthered my understanding of developing and communicating design projects on a pragmatic level. I learned the importance of beginning with a clear objective and communicating in a clear, instructional way.





*Final phase of soundscape task by Jason Dilworth*

My project would have greatly benefited from a trial with a class of sophomore graphic design students if time and circumstance had allowed. A fellow graduate student, Jason Dilworth, was kind enough to act as a test subject. This was very helpful, providing a different perspective on the tasks and project. I learned that my time estimate for the soundscape task was too short and that color was important to include in the soundscape supply list.

The importance of the natural experience was revealed when Jason presented a poster completed during the final phase of the soundscape task. Initially had anticipated a poster that clearly portray more of the formal lessons learned from the card system. However, I quickly remembered, as Jason described his concept behind the poster, the natural experience gained from the use of the cards is equally—if not more—important. The formal aspects of design can be learned, but a natural experience cannot. An educator can only create an opportunity for a connection with nature—it cannot be made, forced, or created. Jason's poster portrays his observation of caterpillars building a cocoon during his soundscape experience. He wondered how the sounds he was hearing sounded from inside the cocoon. The caterpillars have become a subject of inspiration and interest to Jason through this experience.

The content of my cards has room for further development. While quickly generating the content for numerous cards, it was challenging to maintain consistent quality. I hope with future development I will be able to refine the tasks, the definitions on the front, the statistics on the reverse of the cards, and the illustration and graphics on both sides.





**Further Directions** This project has significant opportunities for expansion.





Many of the directions could be encapsulated in an accompanying Web site. A Web site as an accompanying resource for the cards creates an opportunity to provide the design instructor with more examples, discussion points, and references.

While each task card presents an art or design precedence relating to the nature of the task, a Web site could create the opportunity to provide a greater range and depth of visual precedence. Discussion points relating to each task could also be housed on the Web site. A few discussion points addressing form are currently listed in the booklet that accompanies the cards. The Web site could be an area where connections, of a social or environmental genre, may be presented.

My immediate goal is to create an opportunity in which I might use the cards as they were intended—with design students in an outdoor classroom. I feel this will be the best way to determine the direction of their evolution. Once I have further refined the cards and their process I would like to pursue publishing them. The publishers of textbooks often seek ancillary materials to promote and enhance their books. The cards and their supporting Web site could make connections across many educational subjects, referring instructors and students to a variety of topical books such as: art history, graphic design, ecology, and zoology.







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Alber’s approach to teaching, as described in this book emphasizes affording students the opportunity to experiment and explore before introducing them to established theory. In this book he describes this process through the instruction of a class on color.

Benyus, Janine M. *Biomimicry*. New York: HarperCollins Publishers, Inc., 1997.

Biomimicry is a new science that analyzes nature’s best ideas and adapts them for human use. Janine Benyus provides examples and insight into how the natural world can inform and shape aspects of our lives in unanticipated ways.

Berryman, Gregg. *Notes on Graphic Design and Visual Communication*. Los Altos: William Kaufman, Inc., 1979.

Berryman’s book is a collection of notes based on his fifteen years of teaching experience at the University level. Of my research into the application of Gestalt theory to graphic design I found his presentation to be the most cogent.

Dondis, Donis A. *A Primer of Visual Literacy*. Cambridge: The MIT Press, 1973.

As a canon in design education, Dondis defines the basic elements and techniques of visual communication. Of specific interest to me was her use of Gestalt Theory to help the reader understand intuitive processes.

Gordon, Ian E. *Theories of Visual Perception*. New York: Psychology Press, 2004.

This book provides a clear understanding and history of Gestalt Theory and Psychology.

Hofmann, Armin. *Graphic Design Manual Principles and Practice*. Switzerland: Niggli Verlag, 1965.

A master design educator, Hofmann outlines his premise for teaching the basic elements and principles of design as a means to create a solid foundation from which design students may best be prepared for the constantly evolving world of design.

Itten, Johannes. *The Elements of Color*. New York: Van Nostrand Reinhold, 1970.

Itten recognizes the basic laws of color and form, proportions, texture and rhythm as the foundation of his own concept of art education. This is recognized in this book’s discussion of color theory featuring exercises and a discussion of Itten’s “The Seven Color Contrasts.”

Kohler, Wolfgang. *Gestalt Psychology*. New York: Liveright Publishing Corporation, 1947.

One of the fathers of Gestalt Psychology, Kohler, introduced it to the American public in 1947 through this book.

Leborg, Christian. *Visual Grammar*. New York: Princeton Architectural Press, 2006.

Leborg’s book is one of the most recent to address visual language in relation to the elements and principles of design. While pulling from the theorists before him, he creates new relations and perspectives with divisions such as: abstract vs. concrete and activities vs. relations.

Louv, Richard. *Last Child in the Woods*. Chapel Hill: Algonquin Books of Chapel Hill, 2005.

Richard Louv introduces the concept of nature deficit disorder that addresses the evolving divide between the outdoors and today’s wired generation. This is one of the first books to bring together a body of research indicating exposure to nature is essential for the physical and emotional health of children and adults.

Lupton, Ellen and Jennifer Cole Phillips. *Graphic Design The New Basics*. New York: Princeton Architectural Press, 2008.

Recently published, this book illustrates modern design applications of the traditional elements and principles of design. An interesting update highlighted in this book is the introduction of transparency to the traditional list of design basics.

Maier, Manfred. *Basic Principles of Design: the Foundation Program at the School of Design Basel, Switzerland*. Switzerland: Verlag Haupt Berne, 1977.

This overview of the Basel School’s foundation courses includes student work and illustrates the school’s approach that is based on objective developmental education. The Basel School disregards trends, but allows enough freedom to integrate necessary innovations.

McCreight, Tim. *Design Language*. Portland: Brynmorgen Press, Inc., 1996.

McCreight’s pocket sized book provides definitions, background, etymology and commentary of 100 keywords used by designers.

McDonough, William, and Michael Braungart. *Cradle to Cradle*. New York: North Point Press, 2002.

This book reveals the inadequacy of ‘reduce, reuse, and recycle.’ Utilizing the idea that waste equals food, it presents examples illustrating how products might be designed from the outset to provide nourishment at the end of their lives.

Meggs, Philip B. *A History of Graphic Design*. Second Edition. New York: Van Nostrand Reinhold, 1992.

The first to tackle the history of graphic design, Meggs provides precedent and history essential for the education of graphic designers.

Papanek, Victor. *The Green Imperative*. New York: Thames and Hudson Inc., 1995.

Papanek believes passionately in the power of design to influence our lives and the environment for good or ill. Of specific interest was the chapter titled ‘Toward the Spiritual in Design,’ which calls for ethical responsibility and spiritual values to help find a more sustainable and harmonious way of life.

Ruder, Emil. *Typography A Manual of Design*. Switzerland: Arthur Niggli Ltd. 1977.

As an instructor at the Basel School, Ruder illustrates the elements and principles of typographic design through examples of his work, student work, and historical reference.

Wassily, Kandinsky. *Point and Line to Plane*. New York: Dover Publications, 1979.

As an instructor at the Bauhaus Kandinsky’s goal was to emphasize how basic elements are viewed. He introduced a systemization of his theories in this book.

Wong, Wucious. *Principles of Two-Dimensional Design*. New York: John Wiley & Sons, Inc., 1972.

The theories presented in this book were developed by Wong’s work at the Chinese University of Hong Kong. Wong addresses concepts of form and structure within two-dimensional design.





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